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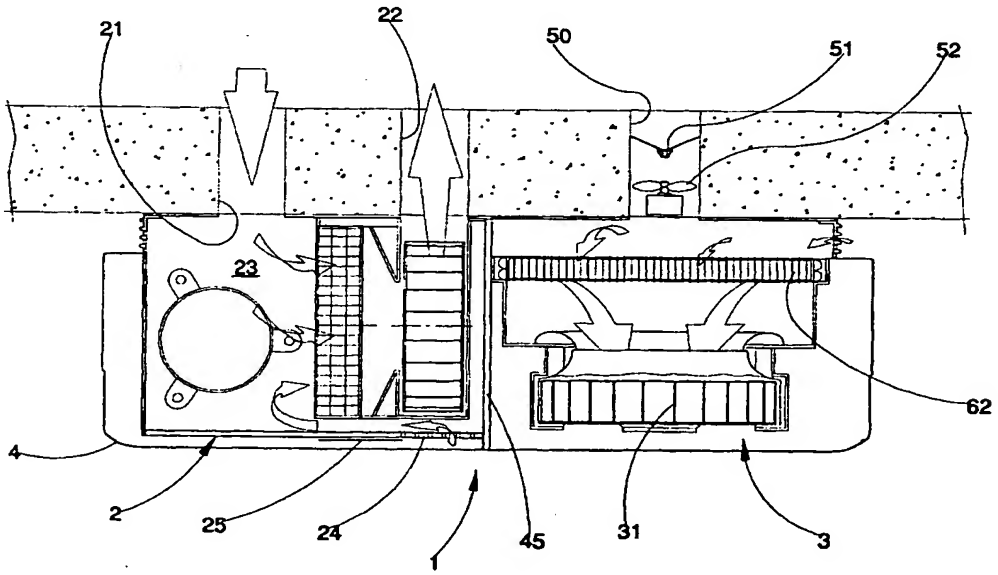
(54) Title: A WALL MOUNTED AIR CONDITIONER



(57) Abstract: The invention relates to a single-block air conditioner comprising a condenser unit (2), traversed by a main flow of outside air between an input section (21) and an output section (22), and an evaporator unit (3), traversed by a flow of air internal to the space to be conditioned, which comprises a fan (31) positioned with the inlet in front of an evaporator (62). The evaporator unit (3) is structured in such a way that at least a fan (31) is contained in a chamber that is delimited laterally by vertical or nearly vertical walls whilst its upper side and its lower side are suitable for being closed indifferently and alternatively with a wall (32) and with a grid (33), for regulating air outflow, and vice versa.

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Description

A Wall Mounted Air Conditioner

Technical Field

The present invention relates to a single-block wall-mounted air conditioner

In particular, it is of the type comprising a condenser unit, traversed by a main flow of outside air between an input section and an output section, which are in communication with the exterior, and an evaporator unit, traversed by a flow of air internal to the space to be conditioned, which unit comprises a fan positioned with the inlet in front of an evaporator.

The conditioner can be wall mounted so that said input section and said output section can be set to coincide with appropriate holes for communication with the exterior, obtained in the wall.

In regard to positioning on the wall, normally two possibilities exist: low, at a short distance from the floor, or high, in proximity to the ceiling.

Depending on the positioning, the disposition of the conveying grid through which the cooled (and dehumidified) air is reinserted into the space changes: if the position is low, the grid must be located in the upper part of the conditioner, if it is high, the grid must be located in the lower part of the conditioner.

Background Art

To satisfy these two different requirements, the prior art provides the traditional solution of building two distinct apparatuses: one structured for low positioning, the other one structured for high positioning.

Disclosure of Invention

The main aim of the present invention is to provide a single-block conditioner equipped with a single structure, comprising a condenser unit and an evaporator unit

set side by side, able to be adapted indifferently for low or high positioning.

A sure advantage of the invention is its structural simplicity.

Another advantage of the invention is represented by its ability to enable the achievement, in a simple manner, of an effective air renewal in the interior space in which the conditioner is installed and operating.

These aims and others besides are all achieved by the invention as it is characterised by the claims set out below.

Description of the Drawings

Further features and advantages of the invention shall become more readily apparent from the detailed description that follows of a preferred, but not exclusive, embodiment of the invention, illustrated purely by way of non limiting example in the accompanying drawings, in which:

- Figure 1 shows a schematic section drawn according to a horizontal median plane;
- Figure 2 shows, in enlarged scale, a schematic section of the evaporator unit 3 drawn according to a vertical median plane;
- Figure 3 schematically shows the possible positions of the invention in a space;
- Figure 4 shows a schematic exploded perspective view.

Description of the Illustrative Embodiment

With reference to the aforementioned figures, the reference number 1 indicates a single-block air conditioner apparatus comprising a condenser unit 2, traversed by a main flow of external air between an input section 21 and an output section 22, and an evaporator unit 3, traversed by a flow of air internal to the space to be conditioned, which, in turn, comprises a fan 31 positioned with the inlet in front of an evaporator 62.

The condenser unit 2 and the evaporator unit 3 are set side by side and are enclosed in a single rigid case or cover 4.

In particular the condenser unit 2 comprises a chamber 23 which is in communication with the exterior through said input section 21 and output section 22.

Also provided is a mouth 24 able to place in communication said internal space with the chamber 23.

The mouth 24 is provided with closure organs (25) whose activation is controlled in a motorised manner by an external remote control set not shown herein and, by placing the internal space to be condition in communication, it serves the purpose of enabling the achievement of an appropriate air renewal. The chamber 23, during normal operation, is under a slight vacuum and hence is able to intake air from said interior space.

The evaporator unit 3 is structured in such a way that at least the fan 31 is contained in a chamber which is laterally delimited by vertical or nearly vertical walls whilst its upper side and its lower side are suitable for being closed alternatively and indifferently with a wall 32 and with a grid 33 for regulating the outflow of air.

In other words, depending on the need to direct the outflow of air upwards or downwards, the grid 33 can be mounted superiorly or inferiorly whilst the wall 32 is correspondingly mounted to close the lower side or the upper side of the chamber inside which the fan 31 is contained.

This is made possible by the choice of a radial fan 31.

With this simple adaptation operation it is thus possible to ready the single-block conditioner apparatus to be placed in the low position, a short distance from the floor, or in the high position, in proximity to the ceiling.

Thanks to the structure of the evaporator unit, adaptation is very simple and quick and it is further facilitated by the characteristics of the rigid case or cover 4 which has approximately parallelepiped shape and is provided with a slit 41, extending in width in proximity with an edge of the front face 42 of the case itself.

The slit 41 occupies the entire width of the rigid case of cover 4 and it is set up to be easily inserted (and extracted), with a snap-on coupling without screws or other

fastening organs, a closure element 43.

The latter comprises a half constituted by an open area, provided with the grid 33, to allow the passage of air flowing out of the evaporator unit 3, and another half constituted by a panel destined to house indication and control organs, in addition to the mouth 24.

The rigid case 4 is suitable to be coupled indifferently on the assembly formed by the condenser unit 2 and by the evaporator unit 3 with the slit 41 positioned superiorly or with the same slit 41 positioned inferiorly.

The closure element 43 in turn can be mounted in the slit 41 in such a way as to have its own open area always facing the grid 33.

In the installation example illustrated herein, a third hole 50 for the exterior communication of the evaporator unit 3 is shown.

A motorised shutter 51 and an electrical fan 52 are installed on said hole.

A renewal of the air in the space can be achieved by activating the opening of the shutter 51, and the electric fan 52, so as to replenish in pressure equilibrium any air ejected outwards through the mouth 24.

Described in its function as an air conditioner, in which the condenser unit (2) is destined to the treatment of outside air whilst the evaporator unit (12) treats the air in the space, the apparatus may also work as a heat pump. In this case, the functions of the two exchange units (2) and (3) will be inverted, with the first unit (2) serving as an evaporator unit, and the second one (3) as a condenser unit.

Obviously, the invention can be subject to numerous modifications of practical nature to its constructive details, without thereby departing from the protective scope of inventive idea as claimed below.

Claims

1. A single-block air conditioner comprising a condenser unit (2), traversed by a main flow of outside air between an input section (21) and an output section (22), and an evaporator unit (3), traversed by a flow of air internal to the space to be conditioned, which comprises a fan (31) positioned with the inlet in front of an evaporator (62), characterised in that said evaporator unit (3) is structured in such a way that at least said fan (31) is contained in a chamber that is delimited laterally by vertical or nearly vertical walls whilst its own upper side and its own lower side are suitable for being closed respectively with a wall (32) and with a grid (33), for regulating air outflow, or vice versa.

2. An air conditioner as claimed in claim 1, characterised in that said condenser unit (2) and said evaporator unit (3) are set side by side and are enclosed by a single rigid case or cover (4).

3. An air conditioner as claimed in claim 1 or 2, characterised in that said condenser unit (2) comprises a chamber (23) which is in communication with the exterior by means of said input section (21) and output section (22); a mouth (24) being provided, able to place in communication said internal space with said chamber (23).

4. An air conditioner as claimed in claim 3, characterised in that said mouth (24) is provided with closure organs (25) whose operation is commanded by an external remote control set.

5. An air conditioner as claimed in claim 3 or 4, characterised in that said rigid case (4) has approximately parallelepiped shape and is provided with a slit (41), which extends in width in proximity with an edge of the front face (42) of the case

itself and into which a closure element (43) can be inserted; said rigid case (4) being suitable to be coupled on the assembly formed by said condenser unit (2) and by said evaporator unit (3) with the slit (41) positioned superiorly or with the same slit (41) positioned inferiorly.

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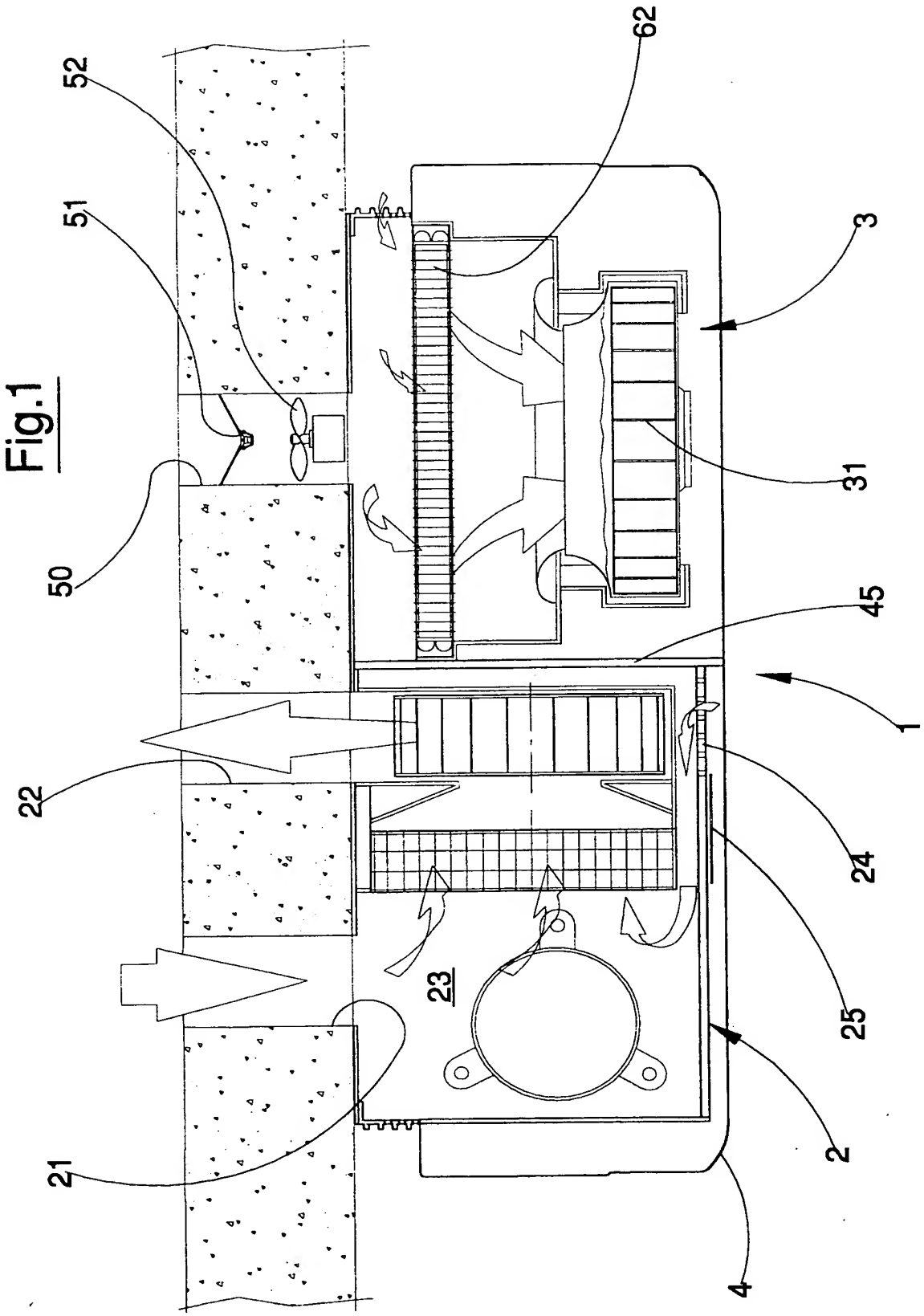
6. An air conditioner as claimed in claim 1 or 2, characterised in that the fan (31) is of the radial type.

Fig.1



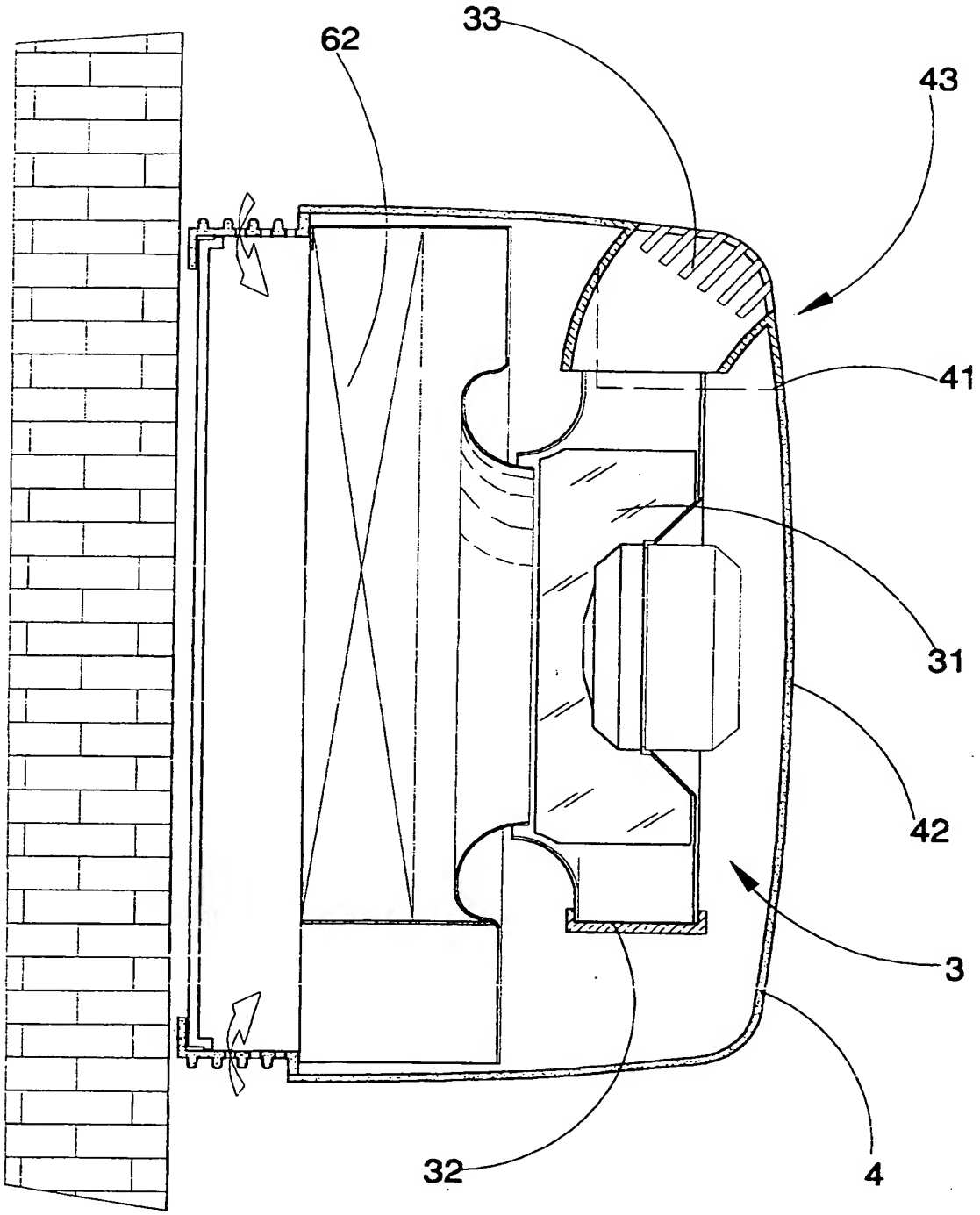


Fig. 2

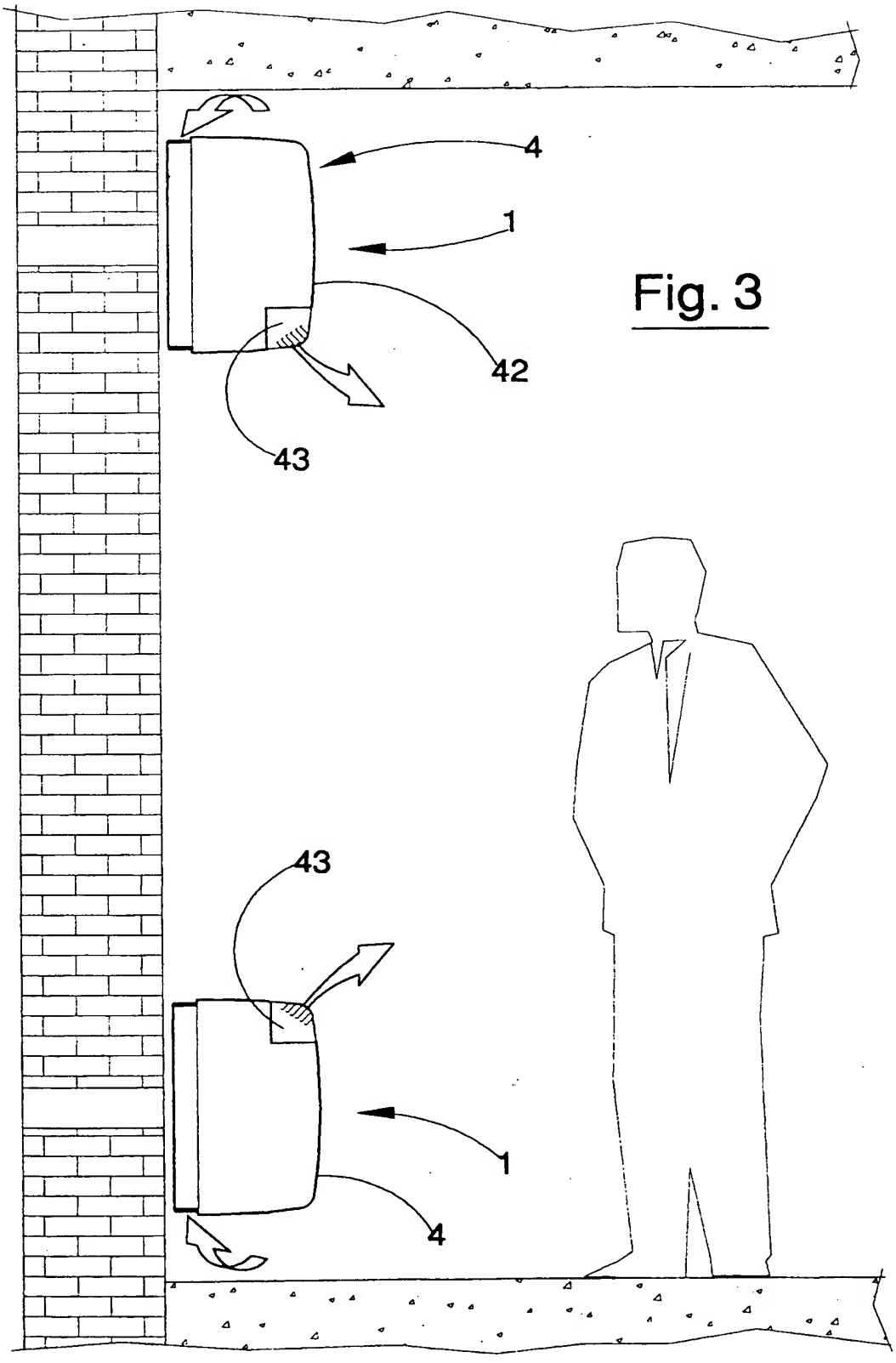


Fig. 3

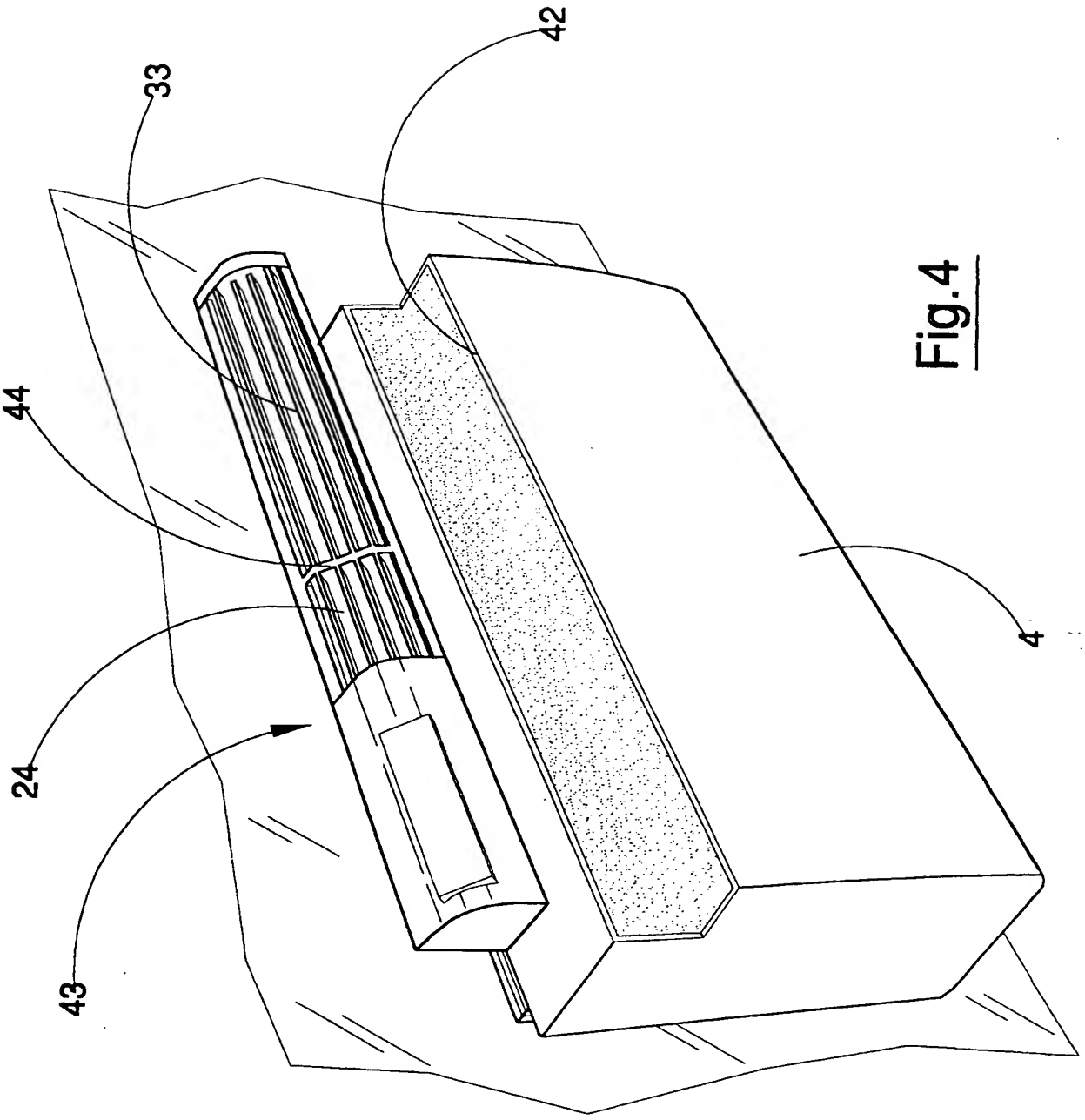


Fig.4

INTERNATIONAL SEARCH REPORT

International Application No
PCT/IT 00/00282

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 F24F1/02

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 F24F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
EPO-Internal, WPI Data, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	GB 2 251 064 A (CREDA LTD) 24 June 1992 (1992-06-24) abstract claim 1 figures 1-3	1-6
A	US 4 492 094 A (KATAYAMA KANEO) 8 January 1985 (1985-01-08) column 1, line 4 -column 2, line 6 claims 1-6 figures 4-7D	1-6
A	US 3 159 983 A (METCALFE FREDERICK S) 8 December 1964 (1964-12-08) column 1, line 9 -column 1, line 45 figures 1,2	

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[X] Further documents are listed in the continuation of box C.

[X] Patent family members are listed in annex.

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"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

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"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
5 October 2000	13/10/2000

Name and mailing address of the ISA	Authorized officer
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INTERNATIONAL SEARCH REPORT

International Application No
PCT/IT 00/00282

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	DE 27 06 399 A (RIELLO CONDIZIONATORI SAS) 23 March 1978 (1978-03-23) claim 1 figures 1-5	

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Information on patent family members

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